

In re Patent Application of:
CHANG ET AL.
Serial No. 10/786,261
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AMENDMENTS TO THE CLAIMS

1. (original) A polarization dependent depolarizer for depolarizing two linear orthogonally polarized incoming beams of light, comprising:

a) a housing having polarization maintaining input optical fibers for providing polarized light into the housing and an output optical fiber for directing a single depolarized beam out of the housing;

b) a polarization beam combiner disposed within the housing and oriented to receive the two linear orthogonal components of light exiting the input optical fibers and for combining the two beams into a single beam;

c) a first high order depolarizing waveplate having a principle optical axis and having a length along said axis so as to achieve depolarization of a beam propagating entirely along said axis such that the DoP of the beam exiting the first high order depolarizing waveplate is less than 20 percent, whereby different wavelengths of light in said beam will have a different polarization than other wavelengths in said beam, said waveplate having ordinary and extraordinary indices of refraction, a difference of said indices of refraction being at least 0.1, said first high order depolarizing waveplate being oriented such that orthogonally linear components of the beam received from the polarization beam combiner are at substantially 45 degrees to the optical axis of the first high order depolarizing waveplate, wherein in operation, light exiting the first high order depolarizing waveplate is optically coupled to the output optical fiber.

2. (original) The polarization dependent depolarizer as defined in claim 1 wherein a second high order depolarizing

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waveplate is disposed within the housing oriented to have its principle axis optically aligned with said first high order depolarizing waveplate to receive an output beam therefrom, in operation, the beam after propagating through the first and second high order depolarizing waveplates having a DoP of less than 10 percent.

3. (withdrawn) The polarization dependent depolarizer as defined in claim 1 further comprising a non-reciprocal rotating means disposed within said package and in line with the a first high order depolarizing waveplate for preventing a substantial portion of any light propagating in a direction toward the input optical fibers from coupling to said optical fibers.

4. (original) The polarization dependent depolarizer as defined in claim 2 further comprising a non-reciprocal rotating means disposed within said package and in line with the a first high order depolarizing waveplate for preventing a substantial portion of any light propagating in a direction toward the input optical fibers from coupling to said optical fibers.

5. (withdrawn) The polarization dependent depolarizer as defined in claim 3, wherein polarization beam combiner is a beam combiner/splitter and wherein the beam combiner/splitter and the non-reciprocal rotator form an optical isolator for substantially preventing back reflections from coupling into the polarization maintaining input fibers.

6. (original) The polarization dependent depolarizer as defined in claim 2, wherein the difference in index of

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refraction of ordinary and extraordinary axes of the high order waveplate is about 0.2 or greater.

7. (currently amended) The polarization dependent depolarizer as defined in claim 3, wherein said high-order depolarizing 45° waveplate has a length defined in accordance with the mode spacing of the incident beam, so as to realize an output beam having a degree of polarization (DoP) of less than ten percent.

8. (original) The polarization dependent depolarizer as defined in claim 2, wherein the first and second high order depolarizing waveplates have non-parallel inwardly facing end faces for reducing back reflections from coupling back into the first high order waveplate by unwanted etalon effects.

9. (original) The polarization dependent depolarizer as defined in claim 8, wherein the first and second high order depolarizing waveplates are disposed within the package such that they are offset from each other to lessen the unwanted effects of back reflections.

10. (original) The polarization dependent depolarizer as defined in claim 6, wherein the beam combiner comprises a Wollaston prism.

11. (original) The polarization dependent depolarizer as defined in claim 10, wherein the beam combiner further comprises a walk-off crystal for overlapping the two input beams of light.